20
~~49~~

CLAIMS

1. A method for the determination of a tetracycline in a sample characterized in that

- the sample is brought into contact with prokaryotic cells encompassing a DNA vector including a nucleotide sequence encoding a light producing enzyme under transcriptional control of a tetracycline repressor and a tetracycline promoter,
- detecting the luminescense emitted from the intact cells, and
- comparing the emitted luminescence to the luminescence emitted from cells in a control containing no tetracycline
- wherein a detectable luminescence higher than a luminescence of the control indicates the presence of tetracycline in the sample.

2. The method according to claim 1 characterized in that the cells are *Escherichia coli*.

3. The method according to claim ~~1 or 2~~ characterized in that the DNA vector is a plasmid containing the luxCDABE genes (SEQ ID NO: 3), tetracycline repressor (TetR) (SEQ ID NO: 11) and tetracycline promotor (TetA) (SEQ ID NO: 9) from *Tn*10.

4. The method according to claim 3 characterized in that the DNA vector is the plasmid pTetLux1 (SEQ ID NO: 3).

5. The method according to claim ~~1 or 2~~ characterized in that

- the DNA vector is a plasmid containing the insect luciferase gene (SEQ ID NO: 1), tetracycline repressor (TetR) (SEQ ID NO: 11) and tetracycline promotor (TetA) (SEQ ID NO: 9) from *Tn*10, and that

21
50

- D-luciferin is added to the mixture of the sample and the cells in order to initiate the luminescence of the cells.

6. The method according to claim 5 characterized in that the DNA vector is the plasmid pTetLuc1 (SEQ ID NO: 1).

claim 1
7. The method according to ~~any of the claims 1 - 6~~ characterized in that the sensitivity of the analysis with respect to the tetracycline is controlled by
- increasing or decreasing the concentration of divalent metal ions, e.g. magnesium ions, or
- adjusting the pH, or
- combined adjusting of the divalent metal ion concentration and the pH.

claim 1
8. The method according to ~~any of the claims 1 - 6~~ characterized in that the sensitivity of the analysis with respect to the tetracycline derivative is increased by the use of cells which are especially antibiotic sensitive mutant strains.

claim 1
9. The method according to ~~any of the claims 1 - 8~~ characterized in that the luminescence is measured using an X-ray or polaroid film, a CCD-camera, a liquid scintillation counter or a luminometer.

claim 1
10. The method according to ~~any of the claims 1 - 9~~ characterized in that the sample to be analyzed is milk, fish, meat, infant formula, eggs, honey, vegetables, serum, plasma, whole blood or the like.

11. A recombinant prokaryotic cell characterized in that it encompasses a DNA vector including a nucleotide sequence encoding a light producing enzyme,

22
51

tetracycline repressor and tetracycline promoter, and that the DNA vector is a plasmid containing the luxCDABE genes (SEQ ID NO: 3), tetracycline repressor (TetR) (SEQ ID NO: 11) and tetracycline promotor (TetA) (SEQ ID NO: 9) from *Tn*10.

12. The cell according to claim 11 characterized in that it is *Escherichia coli*.

13. The cell according to claim 11 ~~or 12~~ characterized in that it is in dried form, e.g. in lyophilized form.

14. A plasmid characterized in that it comprises the luxCDABE genes (SEQ ID NO: 3), tetracycline repressor (TetR) (SEQ ID NO: 11) and tetracycline promotor (TetA) (SEQ ID NO: 9) from *Tn*10.

15. A plasmid according to claim 14 characterized in that it is pTetLux1 (SEQ ID NO: 3).